

Trend Study 2-19-01

Study site name: Right Fork Logan Canyon.

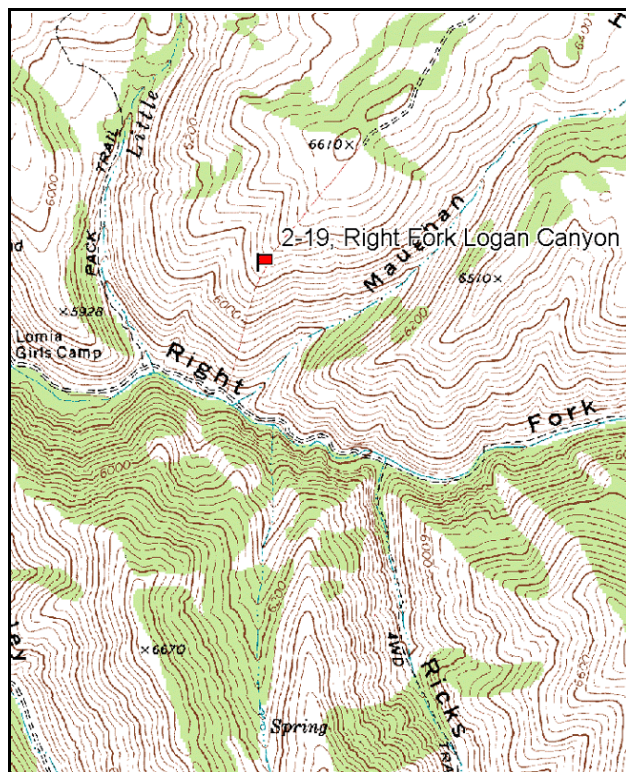
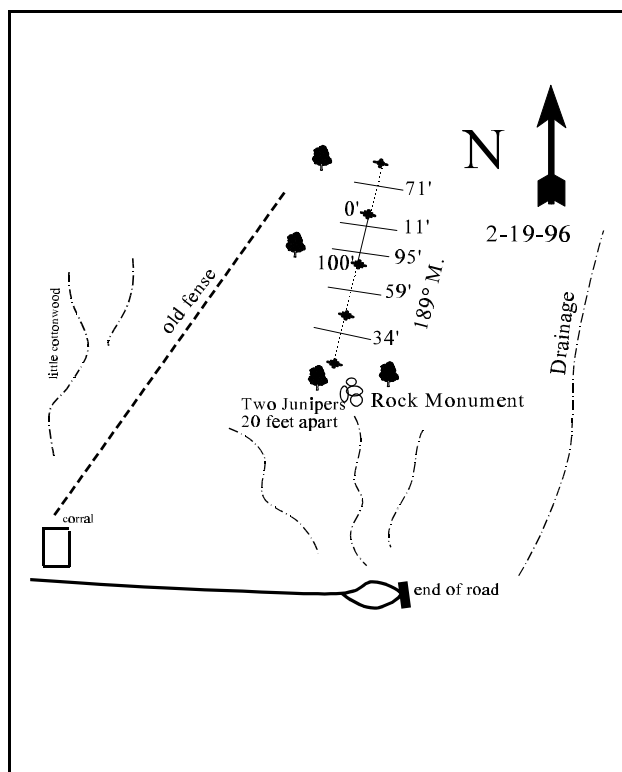
Vegetation type: Bitterbrush.

Compass bearing: frequency baseline 189 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (59ft), line 3 (34ft), line 4 (71ft). Rebar: belt 1 on 8 ft, belt 3 on 1 ft, belt 5 on 8 ft.

LOCATION DESCRIPTION

Drive up the Right Fork of Logan Canyon. Bear left at the girls camp. Go 0.6 miles to the end of the road just past the corral. Hike up the ridge to the north, going about 3/4 mile towards the ridgeline. Look for a rock monument between two junipers that are 20 feet apart. The hike from the bottom to the study is about 600 feet in elevation gain. The baseline runs 189 degrees magnetic. Lines 2 and 3 continue south from the 100 foot baseline. Line 4 runs off the 0-foot baseline stake at 9 degrees magnetic.

Map Name: Temple PeakTownship 12N, Range 3E, Section 16

Diagrammatic Sketch

UTM 4625144 N, 449598 E

DISCUSSION

Trend study No. 2-19

The Right Fork Logan Canyon trend study, established in 1990, samples an area representative of important elk and deer winter range on the south-facing slopes from Cowley to Willow Canyon. The site is located on a south, southeast aspect with a 35% slope at an elevation of 6,100 feet. The land is administered by the U.S. Forest Service. Elk pellet groups were common in 1996 with a quadrat frequency of 47%, while deer sign was moderately abundant with a quadrat frequency of 22%. Cows were allowed into the Little Cottonwood drainage on the date of study establishment (6/25/90), but they did not appear to utilize the upper slopes that year. During the 1996 reading, cattle sign was noted on the study site. Pellet group transect data taken in 2001, estimated 17 deer and 83 elk days use/acre (41 ddu/ha and 205 ed/ha). Most of the elk use appears to be from late winter. Cattle use was light at an estimated 2 cow days use/acre (4 cdu/ha). In 2001, cows were seen near the top of the hill where the slope is more gentle. Two deer were also seen on the site.

The soil is moderately shallow and very rocky with a slightly alkaline soil reactivity (pH of 7.6). Texture is a clay loam. Effective rooting depth (see methods) was estimated at about 8 inches with a layer of rock encountered at that depth. The presence of deeper rooted shrubs on the site would suggest that this layer of rock has cracks and long fissures, allowing deeper rooted plants to become established. Rock and pavement comprise about one-third of the ground cover. Vegetative cover from grasses, forbs, and litter is good leaving 13% to 14% bare ground cover. Some soil movement occurs, although it is not excessive. The soil erosion condition class was determined to be slight in 2001.

Browse forage is limited on the site with all species combined producing less than 8% cover in 2001. The key browse species is bitterbrush. Density is low at only 232 plants/acre in 1990, increasing to 320 in 1996, and 380 by 2001. The increase in density between 1990 and 1996 is mostly the result of the larger sample used in 1996. All of the bitterbrush sampled in 1990 displayed heavy use and percent decadency was high at 72%. Use was more moderate in 1996 with heavy use reported on 44% of the population. Decadency declined to 19%. Vigor was normal with good leader growth. Density remained relatively stable in 2001 with similar moderate to heavy use and good vigor. Percent decadence declined to 11%. The population appears stable but an obvious small die-off occurred between 1990 and 1996, illustrated by the high proportion of dead plants in the population (1 dead to every 2 live) in 1996.

A few serviceberry and mountain big sagebrush offer additional preferred forage on the site but they occur in small numbers. Both species have displayed moderate to heavy use since 1990. Snowberry is abundant and mostly unutilized. The large decline in snowberry density is mostly the result of the much larger sample used in 1996 as there were no dead plants found in the population to explain the large decline. As explained in other site narratives, the larger sample design gives significantly better population estimates for species that characteristically are clumped or discontinuous in their respective distributions. Junipers are scattered across the slope. All have been highlined.

The site supports a vigorous stand of bluebunch wheatgrass, but bulbous bluegrass is the most abundant species making up 65% of the grass cover and 43% of the total herbaceous cover in 2001. Annual cheatgrass and rattlesnake brome are also present but not abundant. Forbs are diverse and moderately productive. Perennial forbs are primarily early season species, yet are numerous enough to provide some spring forage. By far the most abundant perennial forb is gray lomatium which makes up the majority of the forb cover (71% in '96 and 61% in '01). Arrowleaf balsam root, tapertip hawksbeard, and yellow salsify are also moderately abundant.

1990 APPARENT TREND ASSESSMENT

The persistent, long-lived bitterbrush can endure heavy use for several years. However, there appears to be no recruitment at this time and the dead plants are evidenced by numerous skeletons which have not been replaced. The long term trend appears to be down with the decline of the key browse species. The grasses remain valuable for elk winter forage. There is some soil movement on the steeper slopes, but the soil trend appears stable for this type of site.

1996 TREND ASSESSMENT

Trend for soil is up due to an increase in litter cover and a decline in percent bare ground. Trend for the key browse is up. It is clear that the population has declined in the past, but since 1990, heavy use has declined from 100% to 44%, vigor has improved, and percent decadence has declined from 72% to 19%. The increase in population density appears to be due in most part to the much larger sample used in 1996. Trend for the herbaceous understory is slightly up for grasses and slightly down for forbs. Trend is considered stable overall. Composition of the grasses could be better. Bulbous bluegrass is still dominant and has increased significantly in nested frequency.

TREND ASSESSMENT

soil - up (5)

browse - up, but low in number (5)

herbaceous understory - stable (3)

2001 TREND ASSESSMENT

Trend for soil is stable with similar ground cover characteristics compared to 1996. There is evidence of some soil movement as most shrubs are pedestalled, but the erosion condition class was determined to be slight in 2001. Some erosion is inevitable due to the steep slopes on the site. Trend for browse is stable. The key species, antelope bitterbrush, displays a stable population density. It is moderate to heavily utilized yet has good vigor and low decadence (11%). There is no recruitment in the form of seedlings and young even though annual leader growth of mature bitterbrush averaged 3 inches in 2001. Secondary browse species, serviceberry and mountain big sagebrush, appear to have stable populations with moderate use, improved vigor, and declining decadence rates. Trend for the herbaceous understory is stable. Sum of nested frequency of perennial grasses and forbs have remained similar to 1996. Bulbous bluegrass still dominates the herbaceous understory by providing 65% of the grass cover and 43% of the total herbaceous cover. It has remained stable in frequency since 1996. Bluebunch wheatgrass, the second most abundant perennial grass, also remained stable.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 02 , Study no: 19

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'90	'96	'01	'90	'96	'01	'96	'01
G	Agropyron spicatum	_a 161	_b 229	_b 180	67	85	76	10.63	6.05
G	Bromus brizaeformis (a)	-	_a 14	_b 27	-	7	12	.23	.53
G	Bromus tectorum (a)	-	_b 148	_a 83	-	52	34	1.09	.92
G	Poa bulbosa	_a 208	_b 342	_b 340	75	99	98	17.93	14.90
G	Poa pratensis	2	-	3	1	-	1	-	.15
G	Poa secunda	_b 144	_a 10	_a 36	62	5	15	.07	.26
Total for Annual Grasses		0	162	110	0	59	46	1.33	1.45
Total for Perennial Grasses		515	581	559	205	189	190	28.64	21.38
Total for Grasses		515	743	669	205	248	236	29.97	22.83
F	Agoseris glauca	-	-	1	-	-	1	-	.00
F	Alyssum alyssoides (a)	-	_a 179	_b 253	-	67	88	.48	2.07
F	Allium spp.	5	-	-	2	-	-	-	-
F	Aster chilensis	-	3	-	-	1	-	.15	-
F	Astragalus utahensis	8	2	3	3	2	2	.06	.06
F	Balsamorhiza sagittata	-	1	-	-	1	-	.71	.42
F	Chaenactis douglasii	-	-	-	-	-	-	.00	-
F	Cirsium undulatum	-	1	1	-	1	1	.00	.00
F	Collomia linearis (a)	-	3	-	-	1	-	.00	-
F	Comandra pallida	2	5	8	1	3	4	.07	.19
F	Collinsia parviflora (a)	-	6	-	-	2	-	.03	-
F	Crepis acuminata	_b 89	_a 29	_a 45	42	15	24	.62	.76
F	Descurainia pinnata (a)	-	2	-	-	1	-	.00	-
F	Epilobium brachycarpum (a)	-	7	-	-	3	-	.01	-
F	Erodium cicutarium (a)	-	3	-	-	1	-	.00	-
F	Hackelia patens	2	-	2	1	-	2	-	.03
F	Lactuca serriola	_{ab} 15	_a 4	_b 15	6	3	11	.01	.13
F	Lomatium grayi	234	205	209	84	80	79	7.01	7.31
F	Machaeranthera canescens	-	2	3	-	1	1	.03	.03
F	Penstemon humilis	9	17	7	4	9	4	.12	.07
F	Phacelia spp.	-	2	-	-	1	-	.03	-
F	Phlox longifolia	-	-	1	-	-	1	-	.00
F	Sisymbrium altissimum (a)	_b 16	_a -	_b 15	6	-	7	-	.14
F	Tragopogon dubius	_a 7	_b 48	_b 41	4	27	21	.42	.63
F	Veronica biloba (a)	-	3	-	-	1	-	.00	-

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'90	'96	'01	'90	'96	'01	'96	'01
	Total for Annual Forbs	16	203	268	6	76	95	0.55	2.22
	Total for Perennial Forbs	371	319	336	147	144	151	9.26	9.69
	Total for Forbs	387	522	604	153	220	246	9.81	11.91

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 02 , Study no: 19

T y p e	Species	Strip Frequency		Average Cover %	
		'96	'01	'96	'01
B	Amelanchier alnifolia	3	2	.18	.03
B	Artemisia tridentata vaseyana	6	6	.03	.66
B	Chrysothamnus viscidiflorus viscidiflorus	15	17	.48	1.38
B	Mahonia repens	4	5	.21	.16
B	Purshia tridentata	12	15	2.35	2.59
B	Sambucus racemosa	2	1	.38	.63
B	Symphoricarpos oreophilus	8	6	2.04	2.04
	Total for Browse	50	52	5.68	7.52

BASIC COVER --

Herd unit 02 , Study no: 19

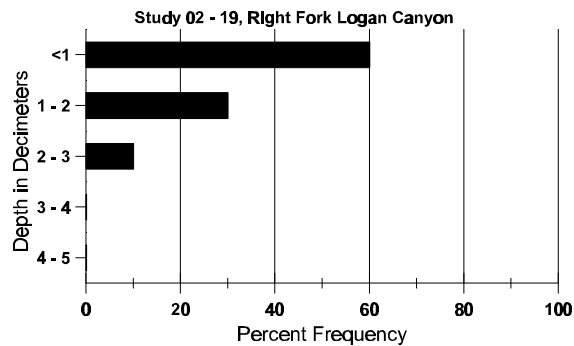
Cover Type	Nested Frequency		Average Cover %		
	'96	'01	'90	'96	'01
Vegetation	369	376	10.00	42.68	46.01
Rock	322	291	31.50	23.11	21.66
Pavement	255	277	12.50	3.64	5.80
Litter	392	331	26.25	30.87	20.84
Cryptogams	102	111	1.00	1.75	3.45
Bare Ground	248	254	18.75	13.05	14.32

SOIL ANALYSIS DATA --

Herd Unit 02, Study no: 19, Right Fork Logan Canyon

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
8.4	63.4 (10.3)	7.6	27.6	34.4	38.0	4.2	13.8	115.2	.7

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 02 , Study no: 19

Type	Quadrat Frequency	
	'96	'01
Elk	47	53
Deer	22	22
Cattle	1	-
Rabbit	-	-

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
'01	'01
1079	83 (205)
218	17 (41)
17	2 (4)
9	N/A

BROWSE CHARACTERISTICS --

Herd unit 02 , Study no: 19

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Amelanchier alnifolia																		
S	90	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	90	-	1	1	-	-	-	-	-	-	1	1	-	-	66		2	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	96	-	1	-	-	1	-	-	-	-	-	-	2	-	40	25	28	
	01	-	2	-	-	-	-	-	-	-	2	-	-	-	40	29	33	
D	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	1	-	-	-	-	-	-	-	-	1	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'90		50%			50%			00%			- 9%							
'96		67%			33%			100%			-33%							
'01		100%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'90	66	Dec:	0%			
												'96	60		33%			
												'01	40		0%			
Artemisia tridentata vaseyana																		
Y	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	96	4	1	-	-	-	-	-	-	-	5	-	-	-	100	28	45	
	01	3	2	1	-	-	-	1	-	-	7	-	-	-	140	27	34	
D	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	1	-	-	-	-	-	-	-	-	-	1	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
X	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	120		6	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'90		00%			00%			00%										
'96		25%			00%			13%			-13%							
'01		29%			14%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'90	0	Dec:	0%			
												'96	160		13%			
												'01	140		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus viscidiflorus																		
Y	90	2	-	-	-	-	-	-	-	-	2	-	-	-	66		2	
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	01	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
M	90	6	5	4	1	-	-	-	-	-	16	-	-	-	533	13	15	
	96	15	-	-	-	-	-	-	-	-	15	-	-	-	300	15	26	
	01	16	-	-	-	-	-	-	-	-	16	-	-	-	320	15	26	
D	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	1	1	-	-	-	-	-	-	-	2	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'90		28%			22%			00%			-43%							
'96		00%			00%			00%			+15%							
'01		05%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'90	599	Dec:	0%			
												'96	340		0%			
												'01	400		10%			
Mahonia repens																		
Y	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
	01	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	96	24	-	-	-	-	-	-	-	-	24	-	-	-	480	3	4	
	01	35	-	-	-	-	-	-	-	-	35	-	-	-	700	3	6	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'90		00%			00%			00%										
'96		00%			00%			00%			+32%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'90	0	Dec:	-			
												'96	520		-			
												'01	760		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
Y	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	1	-	-	-	-	-	-	-	1	-	-	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	90	-	-	2	-	-	-	-	-	-	2	-	-	-	66	29	56	2
	96	-	7	4	-	1	-	-	-	-	12	-	-	-	240	40	74	12
	01	4	7	5	-	-	1	-	-	-	17	-	-	-	340	43	72	17
D	90	-	-	5	-	-	-	-	-	-	4	-	1	-	166			5
	96	-	-	3	-	-	-	-	-	-	3	-	-	-	60			3
	01	-	-	2	-	-	-	-	-	-	2	-	-	-	40			2
X	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	160			8
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	80			4
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'90		00%			100%			14%			+28%							
'96		56%			44%			00%			+16%							
'01		37%			42%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'90	232	Dec:		72%		
												'96	320			19%		
												'01	380			11%		
Sambucus racemosa																		
M	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	2	-	-	-	-	-	-	-	-	2	-	-	-	40	29	44	2
	01	2	-	-	-	-	-	-	-	-	2	-	-	-	40	37	77	2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'90		00%			00%			00%										
'96		00%			00%			00%			+ 0%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'90	0	Dec:		-		
												'96	40			-		
												'01	40			-		

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
Y	90	-	-	-	2	-	-	5	-	-	7	-	-	-	233		7	
	96	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	90	31	5	-	-	-	-	-	-	-	33	-	3	-	1200	26	21	36
	96	6	-	-	3	-	-	-	-	-	8	-	1	-	180	27	50	9
	01	6	-	-	-	-	-	-	-	-	6	-	-	-	120	33	50	6
D	90	2	-	1	-	-	-	-	-	-	3	-	-	-	100		3	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'90		11%			02%			07%			-87%							
'96		00%			00%			10%			-40%							
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'90	1533	Dec:	7%			
												'96	200		0%			
												'01	120		0%			